IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Muraleedhara Herur Navada et al.	Art Unit:	2616
Serial No.:	10/749,792	Examiner:	Nguyen Hoang Ngo
Filed:	December 31, 2003	Assignee:	Intel Corporation
Title:	PACKET FORWARDING		

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BRIEF ON APPEAL

Applicants herewith file this brief on appeal under 37 C.F.R. § 41.37, thereby perfecting the notice of appeal filed January 30, 2008.

(1) Real Party in Interest

Intel Corporation, the assignee of this patent application is the real party in interest.

(2) Related Appeals and Interferences

There are no known related appeals or interferences.

(3) Status of Claims

Claims 1-14, 21-23 and 27-31 are pending with claims 1, 8 and 21 being independent. Claims 1-14, 21-23 and 27-31 are rejected. The rejection of claims 1-14, 21-23 and 27-31 is appealed.

(4) Status of Amendments

The claims have not been amended subsequent to final rejection. There are no unentered amendments.

(5) Summary of Claimed Subject Matter

Claim 1

Claim Language	Support in Specification and/or FIGS.
A method comprising:	See, e.g., page 19, lines 4-8; FIG. 5 and FIG. 6.
receiving a packet at a packet forwarding device in a stack of packet forwarding devices, wherein the packet is received from a source device external to the stack;	See, e.g., FIG. 1, Nos. 10, 28, 30, 32, 12; page 3, lines 1-2; FIG. 5, No.82; FIG. 6, No. 102; page 11, lines 8-23; page 15, lines 10-17; page 16, lines 21-23.
at the packet forwarding device that received the packet from the source device, processing the received packet to: identify a destination device external to the stack of packet forwarding devices, and determine whether at least one other packet forwarding device is to receive the packet before reaching the identified destination device; and	See, e.g., page 11, lines 15-23; page 3, lines 2-5; page 3, line 21 – page 4, line 8; page 6, lines 1-6, 21-24; page 7, lines 12-17; page 9, line 20 – page 10, line 1; page 11, lines 8-12, 15-23; page 12, lines 2-5, 12-15; page 13, lines 1-13; page 15, lines 15-24; page 16, lines 1-5; page 16, line 19 – page 17, line 4; page 17, line 23 – page 18, line 16; FIG. 5, No. 86.

when detecting that the at least one other packet forwarding device in the stack is to receive the packet before reaching the identified destination device, inserting a vector in the received packet, wherein the vector includes data that identifies the identified destination device and the at least one other packet forwarding device in the stack of packet forwarding devices to receive the packet.	See, e.g., page 3, line 21 – page 4, line 8; page 5, line 13-23; page 6, lines 1-24; page 7, lines 3-11; page 7, lines 12-24; page 8, lines 1-24; page 9, lines 1-24; page 10, lines 8-17; page 12, lines 2-5, 12-15; page 16, lines 1-12; FIG. 5, No. 90.

Claim 8

Claim Language	Support in Specification and/or FIGS.
A computer program product, tangibly embodied in a computer-readable medium, the computer program product being operable to cause a machine to:	See, e.g., page 19, lines 4-8; original claim 8.
receive a packet at a packet forwarding device in a stack of packet forwarding devices, wherein the packet is received from a source device external to the stack;	See, e.g., FIG. 1, Nos. 10, 28, 30, 32, 12; page 3, lines 1-2; FIG. 5, No.82; FIG. 6, No. 102; page 11, lines 8-23; page 15, lines 10-17; page 16, lines 21-23.
at the packet forwarding device that received the packet from the source device, processing the received packet to:	See, e.g., page 11, lines 15-23; page 3, lines 2-5; page 3, line 21 – page 4, line 8; page 6, lines 1-6, 21-24; page 7, lines 12-17; page 9, line 20 – page 10, line 1; page 11, lines 8-12, 15-23; page 12, lines 2-5, 12-15; page 13, lines 1-13; page 15, lines
identify a destination device external to the stack of packet forwarding devices, and	

determine whether at least one other packet forwarding device is to receive the packet before reaching the identified destination device; and	15-24; page 16, lines 1-5; page 16, line 19 – page 17, line 4; page 17, line 23 – page 18, line 16; FIG. 5, No. 86.
when detecting that the at least one other packet forwarding device in the stack is to receive the packet before reaching the identified destination device, inserting a vector in the received packet, wherein the vector includes data that identifies the identified destination device and the at least one other packet forwarding device in the stack of packet forwarding devices to receive the packet.	See, e.g., page 3, line 21 – page 4, line 8; page 5, line 13-23; page 6, lines 1-24; page 7, lines 3-11; page 7, lines 12-24; page 8, lines 1-24; page 9, lines 1-24; page 10, lines 8-17; page 12, lines 2-5, 12-15; page 16, lines 1-12; FIG. 5, No. 90.

Claim 21

Claim Language	Support in Specification and/or FIGS.
A packet forwarding device in a stack of packet forwarding devices, wherein the packet forwarding device comprises:	See, e.g., FIG. 1, Nos. 10, 28, 30, 32, 12; page 3, lines 1-2; FIG. 5, No.82; FIG. 6, No. 102; page 11, lines 8-23; page 15, lines 10-17; page 16, lines 21-23.
an input port for receiving a packet, wherein the packet includes header data that identifies a destination device;	See, e.g., FIG. 1, Nos. 10, 28, 30, 32, 12; page 3, lines 1-2; FIG. 5, No.82; FIG. 6, No. 102; page 4, line 10 – page 5, line 12; page 9, lines 1-14; page 11, lines 5-23; page 15, lines 10-17; page 16, lines 21-23.

a switch device connected to the input port, the switch device configured to:	
process the header data to obtain the identified destination device when detecting the received packet is entering the stack directly from a source device external to the stack, and	See, e.g., page 11, lines 8-23; page 3, lines 2-5; page 3, line 21 – page 4, line 8; page 6, lines 1-6, 21-24; page 7, lines 12-17; page 9, line 20 – page 10, line 1; page 11, lines 8-12, 15-23; page 12, lines 2-5, 12-15; page 13, lines 1-13; page 15, lines 15-24; page 16, lines 1-5; page 16, line 19 – page 17, line 4; page 17, line 23 – page 18, line 16; FIG. 3. No. 58; FIG. 5, No. 86;
when detecting that at least one other packet forwarding device in the stack is to receive the packet, insert a vector in the received packet that identifies the identified destination device and the at least one other packet forwarding device in the stack of packet forwarding devices to receive the packet; and	See, e.g., page 3, line 21 – page 4, line 8; page 5, line 13-23; page 6, lines 1-24; page 7, lines 3-11; page 7, lines 12-24; page 8, lines 1-24; page 9, lines 1-24; page 10, lines 8-17; page 12, lines 2-5, 12-15; page 16, lines 1-12; FIG. 5, No. 90.
an output port connected to the switch device, wherein the output port is configured to forward the received packet to the at least one other packet forwarding device in the stack.	See, e.g., page 3, line 21 – page 4, line 8; page 5, line 13-23; page 6, lines 1-24; page 7, lines 3-11; page 7, lines 12-24; page 8, lines 1-24; page 9, lines 1-24; page 10, lines 8-17; page 12, lines 2-5, 12-15; page 16, lines 1-12; FIG. 2A-1, Ports 4-6 (router 28 and router 30); FIG. 2A-2, Ports 4-6 (router 32); FIG. 3, Ports 4-6; FIG. 5, No. 90; and FIG. 6, No. 116.

(6) Grounds of Rejection to be Reviewed on Appeal

The following two separate grounds of rejections are presented by the Office in the Final Rejection Dated November 26, 2007:

(1) Claims 7, 14, 30, 31 stand rejected under 35 U.S.C. 112, first paragraph, as allegedly failing to comply with the written description requirement.

(2) Claims 1-14 and 21-23, and 27-31 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over U.S. Patent Application Publication No. 20030147412 to Weyman et al. ("Weyman") in view of U.S. Patent No. 5,721,820 to Abali et al. ("Abali").

(7) Argument

Claim Rejections Under 35 U.S.C. § 112

The Office contends that the specification fails to disclose the claimed "modifying the vector" as recited in claims 7, 14, 30, 31. The contention is in error and the rejections are respectfully traversed.

The specification teaches "changing the logic stored in the device vector" (see Specification at page 13, lines 1-13), which is modifying the vector. Apparently, the Office Action has completely ignored this portion of the specification. Thus, the rejections under 35 U.S.C. § 112 are in error and should be withdrawn.

Rejections under 35 U.S.C. § 103(a)

Claims 1-14 and 21-23, and 27-31 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Weyman in view of Abali. The rejections are respectfully traversed.

Claim 1 and its dependent claims

The Office concedes that Weyman fails to teach or suggest the claimed "when detecting that the at least one other packet forwarding device in the stack is to receive the packet before reaching the identified destination device, inserting a vector in the received packet, wherein the vector includes data that identifies the identified destination device and the at least one other packet forwarding device in the stack of packet forwarding devices to receive the packet." Then the Office mistakenly alleges, without factual evidence to support the contention, that Abali cures the deficiencies of Weyman.

For example, the Office contends that "Abali further discloses of a source routing protocol in which the packet route Information (inserting vector which includes data that identifies the identified destination device and the at least one other packer forwarding device) is embedded into the packet by the source node (lead node) and that the source processor (lead node) determines the route and encodes the routing instructions in the packet header and that each word in the header indicates a switch port (id for destination device and at least one other packet forwarding device) to forward the packet to (column 1 lines 25-65 and figure 2-4)." (See Office Action Dated November at page 4.) Thus, the Office mistakenly believes that the source node/processor in Abali is the claimed packet forwarding device that inserts the vector in the received packet. However, claim 1 requires that "the packet forwarding device that received the packet from the source device" inserts the vector. (Emphasis added.) In contrast to claim 1, the source node/processor in Abali is a source device external to the stack and not the claimed packet forwarding device that is part of the stack. (See, Abali at column 1, lines 46-51; column 3, lines 17-20.)

> "In the source based routing scheme, unlike destination base routine, switches need not know the network topology; the source processor determines the route and encodes the routing instructions in the packet header. Switches then follow these instructions to forward the packet to its destination."

(See, Abali at column 1, lines 46-51.)

> "The source processor places the route words in the packet. A switch receiving the packet examines the first route word to determine which output port the packet is to be routed to."

(See, Abali at column 3, lines 17-20. Emphasis added.)

The Office contends that the "route words" in Abali is the claimed vector. However, in Abali, the route words are inserted by the source processor and not the switch that received the packet (the alleged packet forwarding device in Abali). Even the label, "source processor" contradicts the rejections. "Source" indicates that the packet originates from it, and "processor" indicates that it is a device that processes information and not a packet forwarding device such as the switch in Abali. Because the source processor in Abali that inserts the "route words" is not the claimed packet forwarding device that received the packet, the descriptions of the source processor in Abali fail to support the rejection.

In addition, the source processor in Abali does not perform the claimed "when detecting that the at least one other packet forwarding device in the stack is to receive the packet before reaching the identified destination device, inserting a vector in the received packet, wherein the vector includes data that identifies the identified destination device and the at least one other packet forwarding device in the stack of packet forwarding devices to receive the packet." In contrast to claim 1, the source processor in Abali determines the various paths or ways for sending the packet through various switches and embeds the "route words" in the data packet

header. (See, Abali at column 3, lines 17-20; column 3, line 49 – column 4, line 5.) Then, the switch receiving the packet examines the received packet to selects one of the paths that is available. (See, *id.*)

> The switch routes the packet adaptively: when the packet arrives at the switch, the switch will search for an unused port from the set of ports indicated in the first route word, in this example, the ports are 0, 1, 4. If none of the ports are available, then the packet is blocked. The packet cannot proceed until at least one of the ports is cleared.

(See, *id.* at column 3, lines 40-48.)

Because the source processor in Abali is not the packet forwarding device that received the packet, the source processor is not able to determine which path is actually available. The source processor merely suggests choices of paths for the switches to use when forwarding the packet.

Further, nothing in Abali suggests that anything remotely close to the claimed vector is inserted by the switch that received the packet. In contrast to claim 1, Abali teaches that each switch that receives that packet deletes a route word (which was inserted by the source processor) from the received data packet. (See *id.* at column 3, lines 17-25.)

> "The source processor places the route words in the packet. A switch receiving the packet examines the first route word to determine which output port the packet is to be routed to. The switch deletes the first route word before forwarding the packet to the next network element. Therefore the next route word becomes the first route word, and the switch receiving the packet will use that route word. A packet has no route word left upon arriving at the destination processor."

(See, *id.*)

No matter how broadly construed, it is unreasonable to construe the deleting of the route word in Abali as the claimed inserting of a vector as recited in claim 1. Deleting refers to removal of something and inserting refers to adding of something. These are polar opposites and cannot reasonably be construed as being equals. Further, because the "route words" are already inserted by the source processor in Abali, there is nothing for the switches to insert.

Thus, even assuming *arguendo*, Weyman and Abali could somehow be combined, which is not conceded, a hypothetical combination of Weyman and Abali still would fail to teach or suggest each and every feature of claim 1.

Moreover, in addressing the recent KSR decision, the U.S. Patent & Trademark Office (USPTO) has made clear that, "in formulating a rejection under 35 U.S.C. 103(a) based upon a combination of prior art elements, it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed." (See Memorandum dated May 3, 2007, to Technology Center Directors from Margaret A. Focarino, Deputy Commissioner for Patent Operations, re Supreme Court decision on KSR Int'l. Co., v. Teleflex, Inc., emphasis added). The current Office Action suggests that it would have been obvious to "incorporate the concept of source based routing in which [ ] routing information (vector) is inserted into a packet as disclosed by Abali into the method of routing data through stacked network routers as disclosed by Weyman in order to correctly and efficiently communicate data through a stacked routers. (See Office Action Mailed November 26, 2007 at page 4, line 18 – page 5, line 2.) However, this ignores the fact that Abali teaches having the source processor embed route words into the packet for the switches to receive. The source processor that determines the possible paths in Abali is not compatible with Weyman because the

source processor removes the decision making process from the lead switch mechanism in Weyman and renders the lead switch in Weyman inoperable. Thus, the proposed combination is unreasonable because the very natures of Weyman and Abali teach away from combining their teachings.

For at least these reasons, claim 1 is allowable over the proposed combination of Weyman and Abali. Claims 2-7 depend from claim 1 and are allowable for at least the same reasons.

Claim 8 and its dependent claims

Claim 8 is allowable for at least reasons similar to claim 1. Claims 9-14 depend from claim 8 and are allowable for at least the same reasons.

Claim 21 and its dependent claims

Claim 21 is allowable for at least reasons similar to claim 1. Claims 22-23 and 27-31 depend from claim 21 and are allowable for at least the same reasons.

CONCLUSION

For all of the above reasons, it is respectfully suggested that the rejections do not meet the Patent Office's burden of providing a prima facie showing of unpatentability. Thus, all of the claims should be in condition for allowance.

Please apply the brief fee, the one month extension of time fee and any required fees not covered, or any credits, to deposit account 06-1050, referencing the attorney docket number shown above.

Respectfully submitted,

Date: June 9, 2008

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Appendix of Claims

1. A method comprising:

receiving a packet at a packet forwarding device in a stack of packet forwarding devices, wherein the packet is received from a source device external to the stack;

at the packet forwarding device that received the packet from the source device, processing the received packet to:

identify a destination device external to the stack of packet forwarding devices, and

determine whether at least one other packet forwarding device is to receive the packet before reaching the identified destination device; and

when detecting that the at least one other packet forwarding device in the stack is to receive the packet before reaching the identified destination device, inserting a vector in the received packet, wherein the vector includes data that identifies the identified destination device and the at least one other packet forwarding device in the stack of packet forwarding devices to receive the packet.

2. The method of claim 1 further comprising:

using the inserted vector and a table to determine a port for sending the received packet to the at least one other packet forwarding device in the stack of packet forwarding devices.

3. The method of claim 2 further comprising:

copying the received packet; and

sending the copy of the received packet through the at least one other packet forwarding device in the stack of packet forwarding devices.

4. The method of claim 1 wherein inserting the vector comprises inserting the data that includes a data bit identifying each of the at least one other packet forwarding device in the stack of packet forwarding devices to receive the packet.

5. The method of claim 1 further comprising:

removing the inserted vector from the received packet before sending the packet to the destination device external to the stack of packet forwarding devices.

6. The method of claim 1 further comprising:

forwarding the received packet to the at least one other packet forwarding device that comprises a router.

7. The method of claim 1 further comprising:

modifying the vector to identify which of the at least one other packet forwarding device has already received the packet.

8. A computer program product, tangibly embodied in a computer-readable medium, the computer program product being operable to cause a machine to:

receive a packet at a packet forwarding device in a stack of packet forwarding devices, wherein the packet is received from a source device external to the stack;

at the packet forwarding device that received the packet from the source device, processing the received packet to:

identify a destination device external to the stack of packet forwarding devices, and

determine whether at least one other packet forwarding device is to receive the packet before reaching the identified destination device; and

when detecting that the at least one other packet forwarding device in the stack is to receive the packet before reaching the identified destination device, inserting a vector in the received packet, wherein the vector includes data that identifies the identified destination device and the at least one other packet forwarding device in the stack of packet forwarding devices to receive the packet.

9. The computer program product of claim 8 being further operable to cause a machine to:

use the inserted vector and a table to determine a port for sending the received packet to the at least one other packet forwarding device in the stack of packet forwarding devices.

10. The computer program product of claim 9 being further operable to cause a machine to:

copy the received packet; and

sending the copy of the received packet through the at least one other packet forwarding device in the stack of packet forwarding devices.

11. The computer program product of claim 8 being further operable to cause a machine to insert the vector that includes a bit identifying the first device in the stack of packet forwarding devices to receive the packet.

12. The computer program product of claim 8 being further operable to cause a machine to:

remove the inserted vector from the header data of the received packet before sending the packet to the destination device external to the stack of packet forwarding devices.

13. The computer program product of claim 8 being further operable to cause a machine to:

forward the received packet to the at least one other packet forwarding device that comprises a router.

14. The computer program product of claim 8 being further operable to cause a machine to:

modifying the vector to identify which of the at least one other packet forwarding device has already received the packet.

21. A packet forwarding device in a stack of packet forwarding devices, wherein the packet forwarding device comprises:

an input port for receiving a packet, wherein the packet includes header data that identifies a destination device;

a switch device connected to the input port, the switch device configured to:

process the header data to obtain the identified destination device when detecting the received packet is entering the stack directly from a source device external to the stack, and

when detecting that at least one other packet forwarding device in the stack is to receive the packet, insert a vector in the received packet that identifies the identified destination device and the at least one other packet forwarding device in the stack of packet forwarding devices to receive the packet; and

an output port connected to the switch device, wherein the output port is configured to forward the received packet to the at least one other packet forwarding device in the stack.

22. The packet forwarding device of claim 21 wherein the switch device is further configured to:

use the inserted vector and a table to determine a port for sending the received packet to the at least one other packet forwarding device in the stack of packet forwarding devices.

23. The packet forwarding device of claim 21 wherein the switch device is further configured to:

remove the inserted vector from the header data of the received packet before sending the packet to the destination device external to the stack of packet forwarding devices.

27. The packet forwarding device of claim 21, wherein the switch device is further configured to:

copy the received packet; and

forward the copy of the received packet to the at least one other packet forwarding device in the stack of packet forwarding devices.

28. The packet forwarding device of claim 21, wherein the switch device is further configured to:

insert the vector that includes a data bit identifying each of the at least one other packet forwarding device in the stack of packet forwarding devices to receive the packet before the destination device.

29. The packet forwarding device of claim 21, wherein the switch device is further configured to:

forward the received packet to the at least one other packet forwarding device that comprises a router.

30. The packet forwarding device of claim 29, wherein the switch device is further configured to:

modify the inserted vector before forwarding the received packet to the at least one other packet forwarding device that comprises a router.

31. The packet forwarding device of clam 21, wherein the switch device is further configured to modify the vector to identify which of the at least one other packet forwarding device has already received the packet.

Evidence Appendix

None.

Related Proceedings Appendix

None